

From: Alexander Petroff petroffwvi@gmail.com
Subject: Re: addendum: update request???
Date: November 2, 2016 at 1:32 PM
To: Peter V. Schwartz pschwartz@calpoly.edu

AP

I think that is a good idea. When a society has a lot of extra energy, as our's has for the past 300 years it is easy not to think about it. As that changes though we will likely end up in the situation of all previous societies and realize that energy matters. After all the first working steam engine wasn't invented by James Watt, but 2000 years in Alexandria. What made the industrial revolution possible however was humans breaking into half a billion years of stored energy. On a more modest energy budget, eroi starts to matter in a big way, and the question becomes not can we do something but can we afford to do something given the other pressing needs for the energy we have.

On Wed, Nov 2, 2016 at 8:14 PM, Peter V. Schwartz <pschwartz@calpoly.edu> wrote:

Alex,

Excellent response. I think that like before we agree and disagree on a number of issues that has made our relationship very valuable to me. I will ponder what you say and respond later. At the very least, your quantitative challenge of EROI is a prefect place to start.

Keep on it, man

Pete

On Nov 2, 2016, at 1:10 PM, Alexander Petroff <petroffwvi@gmail.com> wrote:

I would encourage you to look into the EROI of solar panels from a real world perspective, not a lab perspective. There is only one major real world study that I know of and it is the Spanish one, and they found an EROI of Spanish panels was around 2.4 rather than the higher numbers that the industry labs put out. And even this is with no storage or intercontinental grids smashing that number down further. The thing with batteries and tractors is that I think it is something like one gallon of petrol produces the same energy as around 1 ton of led acid batteries will store. That is a problem for starters, battery tractors have always been too heavy, which from a sustainability problem is a complaint made about regular tractors for decades. The next problem is oxen are just cheaper. A farmer who is going to plow an acre or two once a year or even twice is mad to invest 20k on a tractor.

CO2 of Oxen doesn't concern me, for example North America has far fewer large mammals than it did even a few hundred years ago, this is also the case for Africa. The problem of global climate change is not too many oxen, but too many people who are not willing to sacrifice any of their creature comforts and historically extravagant lifestyles to prevent the worst form happening. So the worst will happen. The comforting news is there is not anywhere near enough economically recoverable fossil fuels to produce the worst case scenerios that the UN is pitching. If activists were serious about climate change they would be advocating at minimum for an immediate ban on all continental air travel, and would start by boycotting it themselves, rather than flying around the world worrying about what poor impoverished farmers in the developing world are contributing to climate change. I know the topic is in vogue right now but I think it is just another case of "casting the shadow."

On Wed, Nov 2, 2016 at 7:31 PM, Peter V. Schwartz <pschwartz@calpoly.edu> wrote:

Alex,

Cool, Thanks, I'll read this to the students. I'm very sorry to hear your update on the things in Congo. I imagine you must be pleased, proud, crushed and worried. I wish you the best.

I have an idea. My focus has been implementing solar panels now that solar is very cheap and only going to get cheaper. Batteries are also coming down in price. I want to revisit the debate we had that brought us together - Animal vs. silicon: bio gas lights versus PV-LEDs. I read on your website that Oxen are the key to the 10 acre farms. I wonder what is the cost of an Ox and what is the CO2 output from one versus using a small tractor that I understand are proliferating in poor countries with economic growth?... what if they were solar electric?

This is where my present research passions are. We are electrifying present technologies that use small internal combustion engines. The result is something that is quieter, more reliable, less expensive to buy, and free to use. I'm thinking we should start on electrifying these tractors. What do you think?

How are things at home?

Peace
Pete

<Screen Shot 2016-11-02 at 12.21.26 PM.png>

On Nov 2, 2016, at 12:24 PM, Alexander Petroff <petroffwvi@gmail.com> wrote:

Hi Pete,

No chance of a call. I am overseas and it costs me \$7 a min to talk on the phone. The short story is that we are still doing